2016 Louisiana Vaccines for Children Program Refrigerator and Freezer Guide

(Revised September 2016)

Louisiana Department of Health
Office of Public Health
Immunization Program

General Requirements

The Centers for Disease Control and Prevention (CDC) and the Louisiana Vaccines for Children (VFC) Program within the state Department of Health, Office of Public Health, Immunization Program *require* the following for any refrigerator or freezer used for vaccine storage:

- Maintain required vaccine-storage temperatures year-round.
    - **Refrigerator:** 36° to 46° F (2° to 8° C)
    - **Freezer:** -58° to 5° F (-50° to -15° C)
- Have sufficient room across the unit to store current stock as well as any additional stock acquired during peak season without overcrowding.

Likewise, CDC and the Louisiana VFC Program *recommend* the following for any refrigerator or freezer used for vaccine storage:

- Be dedicated to vaccine storage only. Food and beverages should not be stored in a vaccine-storage unit because this practice results in frequent opening of the door and destabilization of the temperature.
- Monitor the temperature using a digital data logger thermometer[1] with the following features:
    - Detachable probe in a buffered material (e.g., glycol) with continuous monitoring capabilities
    - Easily-readable temperature from the outside of the unit
    - Alarm for out-of-range temperatures
    - Current, minimum, and maximum temperatures
    - Reset button
    - Low-battery indicator
    - Accuracy of +/-1°F (0.5°C)
    - Memory storage for at least 4,000 readings (the device must also not write over old data and stop recording when memory is full)
    - User-programmable logging interval (or reading rate)
- Be frost-free with an automatic defrost cycle if regular manual defrosting cannot be assured.

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[1]**NOTE:** CDC's recommendation on data-logger use will become a requirement in 2018. In the meantime, effective August 1, 2016, all School-Based Health Centers which are enrolled in the Louisiana VFC Program are already required to use data loggers.

Separate vs. Combined Refrigerators and Freezers

CDC and the Louisiana VFC Program *strongly recommend* that clinics purchase stand-alone, biologic-grade refrigerator and freezer units for vaccine storage. Experience has shown that separate units remove the risk of freezing refrigerated vaccine, increase storage space, and reduce compressor wear associated with a dual zone system.

Some manufacturers also offer biologic-grade refrigerator/freezer combined units. These are purpose-built for biologic storage and utilize dual cooling systems. CDC is currently evaluating the stability of these combined units for vaccine storage.

Equipment Options

Based on the above guidelines, the following is a brief list of refrigerator and freezer options that meet or exceed CDC and Louisiana VFC Program requirements and/or recommendations. This list is by no means exhaustive and merely provides examples of vaccine-storage units to consider when purchasing.

Disclaimer

*As a state-government entity, the Louisiana VFC Program does **not** endorse any specific brand or product. The terms and conditions of a purchase are ultimately between a provider and its vendor.*

Manufacturers

Providers have many options when it comes to purchasing vaccine-storage units. The following are examples of manufacturers:

Panasonic Healthcare: http://www.panasonic-healthcare.com/us/
Follett: http://www.follettice.com
Helmer Scientific: http://www.helmerinc.com
Thermo Scientific: http://www.thermoscientific.com
Lab Research Products: http://www.labresprod.com
Migali Scientific: http://migaliscientific.com
Fisher Scientific: http://www.fishersci.com
Sun Frost: http://www.sunfrost.com
LABRepCo: http://www.labrepco.com

Used and Refurbished Refrigerators and Freezers

There are several online vendors offering used and refurbished equipment at prices often 30-50% off the regular retail price. An additional option is to call a manufacturer of choice and ask about used or "scratch and dent" items. Helmer Scientific, for example, has a rotating inventory of scratch and dent units that come with a lower price plus a full warranty.

If considering a used and refurbished vaccine-storage unit, providers are advised to ask the vendor pertinent questions, choose only reputable brands, and obtain guarantees in writing.

Alliance Analytical: http://www.aaisolutions.com
Ace Laboratory Systems: http://www.acelabsystems.com
LabX: http://www.labx.com
Labequip: http://www.labequip.com

Standard Refrigerators and Freezers

These are the units found in home and appliance stores. Higher-end models are sometimes referred to as "commercial-grade" and are most often used in the foodservice industry. While not ideal for vaccine storage, many providers use this type of unit due to its affordability and availability.

If a provider chooses a standard unit, some *essential* features to look for are:

- Dedication to a single temperature range (i.e., refrigerator only or freezer only)
- Automatic Defrost
- Fully adjustable shelves
- Ample room to store *all* vaccine on the middle 2-3 shelves
- Ability to maintain required temperature ranges

Some *recommended* features include:

- Locks on the outside of the doors
- Digital thermostat controls
- Forced air circulation
- Alarm on door to detect door ajar
- Battery or generator back-up in case of power failure

> **Warning**
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> *Never store freeze-sensitive vaccines near the cold-air vent in refrigerators. It is common for air to blow out of the vents at below freezing temperatures.*

Biologic-grade Undercounter Refrigerators and Freezers

Biologic-grade undercounter refrigerators and freezers are an excellent choice for those providers with limited space. Not to be confused with dormitory-style refrigerators (see below), biologic-grade undercounter refrigerators and freezers are high-quality, standalone units that allow for "best practice" vaccine storage in a small space. Benefits of undercounter refrigerators and freezers include:

- **Lower risk of catastrophic loss.** Separate compressors decrease the risk of loss that might occur in a combined unit.

- **Temperature stability.** Because these units are only required to hold a single set temperature, they are not constantly re-adjusting and "sharing" cold air between the refrigerator and freezer.

- **No risk of accidental freezing or thawing.** Combined units often use a cold-air vent (blowing down air from the freezer) to regulate temperatures in the refrigerator compartment. This rush of freezing air can quickly freeze any vaccines in its path. Conversely, turning up the temperature in your refrigerator can result in a warmer freezer compartment.

- **Cost benefit.** If a provider is looking to add to its existing refrigerator or freezer capacity, an undercounter option allows for the purchase of only what is needed. A single undercounter refrigerator may prevent the need to buy a new larger, more expensive combination unit.

The following are examples of undercounter biological-grade units.

Panasonic Undercounter Scientific-Grade Laboratory Refrigerator (SR-L6111W) and Freezer (SF-L6111W)

Features:

- High-temperature, low-temperature, door, and power-failure remote alarms
- Solid insulated door
- Forced air circulation in cabinet
- Automatic defrosting method
- Microprocessor LED temperature display
- Temperature ranges:
  - Refrigerator: 1°C to 14°C (33.8°F to 57.2°F)
  - Freezer: -25°C to -15°C (-13°F to 5°F)
- Cylinder-type door lock with optional hasp for security
- Digital calibration through front panel

For more information, visit: http://www.panasonic-healthcare.com/us/

Dormitory-Style Refrigerators

A dormitory-style (or bar-style) refrigerator is defined as a combination refrigerator/freezer unit that is outfitted with one exterior door and an evaporator plate (cooling coil), which is usually located inside an icemaker compartment (freezer) within the refrigerator.

CDC and the Louisiana VFC Program prohibit the use of dormitory-style units for storage of VFC vaccines. The freezer compartment in this type of unit is incapable of maintaining temperatures cold enough to store MMRV, varicella, and zoster vaccines. If attempts are made to cool the freezer compartment to the appropriate temperature, the temperature in the refrigerator compartment will fall below the required range, potentially freezing the refrigerated vaccines.

Biologic-grade Full-sized Refrigerators and Freezers

Biologic-grade refrigerators and freezers are considered the best, most secure option for vaccine storage. These "gold-standard" vaccine units are most often found in health departments, laboratories, central pharmacies, and hospitals. Manufacturers in this category offer a range of sizes and options to fit any provider's needs.

The following are examples of full-size biologic-grade units.

Follett REF-20LB Upright Laboratory Refrigerator

Features:

- Custom-designed, modular refrigeration system with microprocessor controller provides a ±1°C performance throughout
- Industry-exclusive plenum air distribution delivers cold air at six different levels
- Frost-free and auto-condensate evaporation
- Easy-to-read LCD shows temperature and provides navigation to feature programming
- High/low-temperature, door-open, power-failure, low-battery alarms
- Full stainless steel interior and exterior provide outstanding resistance to rust and corrosion

For more information, visit: http://www.follettice.com

LABRepCo CliniCool® PRIME 9 cu. ft. pharmacy/vaccine combination refrigerator and freezer

Features:

- Manual defrost freezer with cycle defrost refrigerator
- Microprocessor temperature control with audible and visual alarms
- Digital temperature display
- Remote alarm contacts
- -25°C (-13°F) freezer operating temperature; +4°C (39.2°F) refrigerator operating temperature
- CDC approved power cords

For more information, visit: http://www.labrepco.com

Portable Refrigerators and Freezers



Portable refrigerators and freezers are excellent options for emergency storage, long-distance transport, or use during day clinics in the field. Some units use electricity to run a cooling system, while others use advanced insulation combined with propriety cooling packs. Whichever type a provider chooses will add another layer of protection to a vaccine-management practice.

Portable-unit manufacturers include the following:

Vericor: http://www.vericormed.com
CSafe: http://www.csafeglobal.com
FridgeFreeze: http://www.fridgefreeze.com
Roemer Industries: http://www.roemerindustries.com

Additional Equipment

The following are additional equipment a provider may consider when assessing its vaccine-storage needs.

Alarm Telephone Dialers

These devices, though a relatively old technology, may be useful to providers with limited internet connectivity or recurrent power outages. They are sold by several manufacturers in varied models, styles, and prices to choose from.

Alarm telephone dialers are designed to call pre-determined telephone numbers when temperatures go out of range and are a simple and reliable alarm option, provided the system is accurate. Maintaining a temperature reading that mirrors a current calibrated continuous logger is imperative to the usefulness of a dialer.

Providers have many options when it comes to purchasing dialers. The following are examples of manufacturers:

Sensaphone: http://www.sensaphone.com
Dickson: http://www.dicksondata.com
United Security Products: http://www.unitedsecurity.com
Security Product Solutions: http://www.securityproductsolutions.com

Emergency Power Generators

Disruption in the power supply is one of the most frequent causes of costly vaccine loss, since it does not take long for a refrigerator or freezer to warm up due to a power outage and thus compromise vaccine integrity. Healthcare providers (especially those in rural or coastal areas, or those storing large vaccine inventories) should seriously consider having an emergency power generator in place should an emergency occur. If a provider already has such a unit in place, it must make sure a vaccine refrigerator and freezer are connected to that power circuit.

According to CDC, emergency power generators should be tested quarterly and receive maintenance at least annually (check manufacturer specifications for test procedures and maintenance schedules). In addition, sufficient fuel should be kept on hand to continuously run the generator for at least 72 hours.[2]

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[2]Centers for Disease Control and Prevention. *Vaccine Storage & Handling Toolkit: June 2016*, http://www.cdc.gov/vaccines/hcp/admin/storage/toolkit/storage-handling-toolkit.pdf.

There are many manufacturers and vendors selling generators. Below are a few examples:

Generac: http://www.generac.com
GE Generator Systems: http://www.gegenerators.com
Kohler: http://www.kohlergenerators.com
Briggs & Stratton: http://www.briggsandstratton.com/us/en/generators

Louisiana VFC Program Contact Information

For more information on vaccine-storage refrigerators and freezers, or any other matter concerning VFC requirements or recommendations, please contact the Louisiana VFC Program at (504) 838-5300.